REMARKS

Initially, applicant would like to thank Examiner Nguyen for taking the time to discuss this case with Applicant's representative. In view of that discussion, applicant has amended the claims and provides the following remarks. Entry of the above amendments is respectfully requested.

§ 112 Rejections

In the Action, the Examiner rejected claims 1-4 and 6-20 under 35 U.S.C. § 112, second paragraph, as being indefinite. In particular, the Examiner contends that in claims 1, 9 and 19, it is unclear how "a probe" is associated with "an oscillating probe" and how the oscillating probe is associated with the detector module and boost module. In addition, the Examiner contends that, with respect to claim 1, "it is unclear where 'a cantilever drive signal' is from."

In response, applicant has amended independent claims 1, 9 and 19 to insure that proper antecedent basis is used for the terms "oscillating probe" and "probe" where appropriate. As a result, applicant believes that this rejection has been obviated. With respect to how the oscillating a probe is associated with the detector module 210 and boost module 220 (see amended Figure 5 from April 25, 2003 Reply), this relationship is as follows. The oscillating probe is operatively coupled to the detector module 210 via the detector scheme 105 shown in currently amended Figure 1 (see attached Figure 1). Detector scheme 105 detects oscillation of the probe, for example, by sensing a laser beam reflected from the back of the cantilever, for example, with a quadrant detector photo. The output of the detector scheme 105 is then transmitted to a phase detection circuit 212 (amended Figure 5), which provides a "phase signal" to the detector module 210. Upon processing by the boost module 220, a "composed drive signal out" (Figure 5) is used to drive the oscillating probe, as described in further detail in the specification. As a result, the boost module is operatively coupled to the oscillating probe.

With respect to the "cantilever drive signal", applicant respectfully disagrees with the Examiner that this language is not supported by the specification. This term is used at page 12, line 11 of the specification and is shown as "cantilever drive" in Figure 5 as filed. Nevertheless, to be consistent with the remaining parts of the application and claims, applicant has amended the claims to specifically define the drive of the probe as the "probe drive" and "probe drive signal", as appropriate. Specifically, applicant has amended claim 1, 4, 11, 14, 17 and 18 to clarify this aspect of the preferred embodiment. As a result, each of the rejections in paragraph one of the Office Action are believed to be overcome.

Next, the Examiner rejected claims 1-4 and 6-20 under 35 U.S.C. § 112 as failing to comply with the enablement requirement. The Examiner contends that it is unclear from the specification what "an oscillator probe" represents. Applicant is unclear regarding what the Examiner means by "an oscillator probe" but believes that the Examiner intended to mean "oscillating probe." In that case, the oscillating probe is a probe of the microscope that is driven into oscillation by the probe (cantilever) drive. In particular, the oscillator 130 drives the probe 120 (see amended Figure 1 hereto). With respect to the "cantilever drive signal", applicant directs the Examiner's attention to the argument above regarding support for this limitation.

Finally, the Examiner objected to the April 25, 2003, drawing correction of Figure 1 as showing an ambiguous cantilever drive signal. Moreover, the Examiner stated that the specification does not have support for such a cantilever drive signal. Again, at page 12 line 11 of the original specification, the "cantilever drive signal" is defined. However, although the "cantilever drive" or "probe drive" terms are used to represent alternative language for the driving component, applicant has amended the claims and Figures 1 and 5 to define this aspect of the preferred embodiment as the "probe drive" and "probe drive signal", as noted above.

Together with the above remarks, applicant has amended the drawings to correct Figures 1 and 5 to define the probe drive that produces the probe drive signal consistent with the specification and claims. The terms probe drive and probe drive signal are used throughout the application (for example, at page 3, line 17, page 4, line 1, page 4 line 17, etc.). As such, no new

matter has been added and applicant respectfully requests that these drawing changes be approved.

CONCLUSION

In view of the above, applicant respectfully contends that claims 1, 9, and 19, as well as their respective dependent claims, are in compliance with 35 U.S.C. § 112. Also, each one of the claims is novel and non-obvious over the teachings of the cited art for the reasons set forth in Applicants' April 25, 2003, Reply, and the discussions during the March 31, 2003, interview discussed therein. As such, claims 1-4 and 16-20 are allowable, and an indication to that effect is respectfully requested.

Should the Examiner have any questions or comments, or wish to discuss this case in detail for any reason, he is invited to contact the undersigned at the number below. The Director is authorized to direct any additional fees associated with this or any other communication, or credit any overpayment, to Deposit Account 50-1170.

Respectfully submitted,

Jay G. Durst, Reg. No. 41,723

Dated: October 3, 2003

BOYLE, FREDRICKSON, NEWHOLM,
STEIN & GRATZ S.C.
250 Plaza, Suite 1030
250 East Wisconsin Avenue
Milwaukee, WI 53202
Telephone: (414) 225-9755
Facsimile: (414) 225-9753

APPENDIX SHOWING THE CHANGES FOR SN 09/761,792

In The Drawings:

Applicant, in response to the objection by the Examiner, submits the attached "Request to Approve Drawing Changes."

In The Claims:

1. (Twice Amended) An apparatus for reducing the parachuting of **[a]** **an oscillating** probe measuring the topography of a surface comprising:

[an oscillating probe;]

a detector module operatively coupled to the oscillating probe; and

a boost module **operatively** coupled to the detector module and the **oscillating** probe, wherein, the detector module detects a reduction of a variation of a phase signal from the **oscillating** probe and the boost module boosts a **[cantilever]** **probe** drive signal to the **oscillating** probe based on the phase signal detected by the detector module to produce a boosted probe drive signal.

2. (Twice Amended) The apparatus according to claim 1, wherein the detector module comprises:

a precision full wave rectifier; and

an envelope detector coupled to the precision full wave rectifier,

wherein the precision full wave rectifier rectifies a phase signal of the **oscillating** probe to produce a rectified phase signal and the envelope detector detects the rectified phase signal to produce an envelope detected signal.

3. (Amended) The apparatus according to claim 2, wherein the detector module further comprises:

a comparator coupled to the envelope detector; and

an event detector and hold off circuit coupled to the comparator,

wherein the comparator and the event detector and hold off circuit generate an event signal from the envelope detected signal.

4. (Three Times Amended) The apparatus according to claim 3, wherein the boost module further comprises a multiplier coupled to the event detector and hold off circuit; and

wherein the multiplier combines the event signal with **[a]** **<u>the</u>** probe **[driver]** **<u>drive</u>** signal to produce the boosted probe drive signal.

6. (Amended) The apparatus according to claim 4, wherein the boost circuit further comprises an event level setting circuit coupled between the event detector and hold off circuit and the multiplier of the boost circuit, wherein the event level setting circuit sets an event level of the event signal.

7. (Amended) The apparatus according to claim 4, wherein the boosted probe drive signal is boosted 20 to 30 percent of the probe drive signal above the probe drive signal.

8. (Amended) The apparatus according to claim 3, wherein the event detector and hold off circuit delays the generation of the event signal for a predetermined time.

9. (Twice Amended) A method for reducing the parachuting of **[a]** **an oscillating** probe obtaining accurate information representative of a surface of a sample comprising:

scanning the surface of the sample with **[an]** **the** oscillating probe;

measuring an oscillation of the oscillating probe so as to generate a phase signal;

detecting a reduction of a variation of the phase signal of the **oscillating** probe indicative of free oscillation of the **oscillating** probe; and

reducing a distance between the **oscillating** probe and the sample in response to the detection of the reduction of the variation of the phase signal of the **oscillating** probe.

10. (Amended) The method according to claim 9, wherein the detecting step further comprises:

rectifying the phase signal of the **oscillating** probe to produce a rectified phase signal; and

envelope detecting the rectified phase signal of the **oscillating** probe to produce an envelope detected phase signal of the **oscillating** probe.

11. (Amended) The method according to claim 9, wherein the reducing step further comprises boosting a **probe** drive signal of the **oscillating** probe to produce a boosted drive signal of the **oscillating** probe.

12. (Twice Amended) The method according to claim 11, wherein the detecting step further comprises generating an event trigger signal based on the detected phase signal with a comparator and the boosting step further comprises boosting the **probe** drive signal of the **oscillating** probe by combining the event trigger signal with the **probe** drive signal of the **oscillating** probe to produce a boosted drive amplitude signal.

13. (Amended) The method according to claim 12, wherein the detecting step further comprises delaying the generation of the event trigger signal for a predetermined time.

14. (Amended) The method according to claim 11, wherein the boosted drive signal is 20 to 30 percent of the **probe** drive signal above than the **probe** drive signal.

15. (Amended) The method according to claim 9, further comprising:

detecting an error signal of the **oscillating** probe when the oscillating amplitude of the **oscillating** probe is too high; and

accumulating the error signal of the **oscillating** probe.

16. (Amended) The method according to claim 9, further comprising:

detecting an error signal of the **oscillating** probe when the oscillating amplitude of the **oscillating** probe is too small; and

accumulating the error signal of the **oscillating** probe.

17. (Amended) The method according to claim 9, wherein the detecting step detects a reduction of a variation of a phase signal when the phase difference between a **[sinusoidal]** **probe** drive **signal** and a probe response signal is substantially 90 degrees.

18. (Amended) The method according the claim 9, wherein the reducing step further comprises boosting a **probe** drive signal of the **oscillating** probe to increase the accumulation of an error signal of the **oscillating** probe.

19. (Three Times Amended) An apparatus for reducing the parachuting of a probe measuring the topography of a surface comprising:

[an oscillating probe;]

a detection module coupled to the **[oscillating]** probe to detect parachuting of the probe;

a boost module coupled to the detection module, wherein the boost module reduces the parachuting of the probe in response to the detection of parachuting of the probe.

20. (Amended) The apparatus according to claim 19, wherein the parachuting detection circuitry comprises a detector module and the parachuting reduction circuitry comprises a boost module.